Claim Amendments

Please replace all prior versions of the claims with the following claims listing.

1. (Currently Amended) A wireless communication network comprising:

    a set of n nodes, where at least one of the n nodes comprises:

        an antenna element for transmitting and receiving a wireless signal;

        a detector element configured to determine a minimum transmittance power required to ~~covey~~ convey data to a cluster of nodes, the cluster comprising N nodes of the set of n nodes, wherein $2 \leq N < n\text{-}1$; ~~and~~

        a transmit power adjustment element, operatively interfaced with the detector element, the transmit power adjustment element configured to provide the minimum transmittance power to the antenna element;~~ and~~

        wherein at least one of the nodes is a power-adjustable node, the power-adjustable node further comprises a connectivity table for storing an identifier and the minimum transmittance power associated with the power adjustable node within the cluster.

2. (Original) The wireless communication network of claim 1, the network having a first node outside of the cluster and a second node within the cluster, wherein each node within the cluster of N nodes communicates directly with other nodes within the cluster, and the first node communicates with the second node via multiple hops.

3. (Cancelled)

4. (Original) The wireless communication network of claim 1, wherein the detector element determines the minimum transmittance power by comparing an attenuation of a signal originating at a first node within the cluster with a known transmittance power of the first node.

5. (Original) The wireless communication network of claim 1, wherein the wireless communication network is an ad-hoc network of sensors.

6. (Original) The wireless communication network of claim 1, wherein the wireless communication network is an ad-hoc low-mobility network.

7. (Original) The wireless communication network of claim 1, wherein the detector element periodically updates the minimum transmittance power required to convey data to the N nodes.

8. (Original) The wireless communication network of claim 1, wherein the detector element dynamically determines an operating power level based on multi-hop data throughput data.

9. (Original) The wireless communication network of claim 1, wherein the minimum transmittance power is selected based on interference zones and multi-hop data throughput.

10. (Currently Amended) A wireless communication device for use in a wireless communication network comprising:

an antenna element for transmitting and receiving a wireless signal;

a detector element configured to determine a minimum transmittance power required to convey ~~covey~~ data to a cluster of nodes, the cluster comprising N nodes of a set of n nodes, wherein $2 \leq N < n\text{-}1$; ~~and~~

a transmit power adjustment element, operatively interfaced with the detector element, the transmit power adjustment element configured to provide the minimum transmittance power to the antenna element; <u>and</u>

<u>further comprising a connectivity table for storing an identifier and the minimum transmittance power associated with at least one of the nodes within the cluster.</u>

11. (Cancelled)

12. (Original) The wireless communication device of claim 10, wherein the detector element determines the minimum transmittance power by comparing an

attenuation of a signal originating at a first node within the cluster with a known

transmittance power of the first node.

13. (Original) The wireless communication device of claim 10, wherein the detector

5   element periodically updates the minimum transmittance power required to

convey data to the N nodes.

14. (Original) The wireless communication device of claim 10, wherein the detector

element dynamically determines an operating power level based on multi-hop

10   data throughput.

15. (Original) The wireless communication device of claim 10, wherein the

minimum transmittance power is selected based on interference zones and multi-

hop data throughput.

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16. (Original) A wireless communication network comprising:

a set of n nodes, the set comprising a cluster of N nodes where $2 \leq N < n-1$,

a first node outside the cluster, and a second node inside the cluster,

wherein at least one node in the cluster of N nodes communicates directly

20   with the other N-1 nodes in its cluster, and the first node communicates with the

second node via multiple hops; and

the at least one node comprising:

a detector element configured to determine a minimum

transmittance power required to covey data to a node within the cluster of

25   nodes; and

a transmit power adjustment element operatively interfaced with

the detector element, the transmit power adjustment element configured to

provide the minimum transmittance power to an antenna element.

30   17. (Currently Amended) The wireless communication network of claim 16, wherein

the at least one node is a power-adjustable node in the cluster of N nodes, the

power-adjustable node further comprises a connectivity table for storing an

identifier ~~ID~~ and the minimum transmittance power associated with the power-adjustable node.

18. (Original) The wireless communication network of claim 16, wherein the detector element determines the minimum transmittance power by comparing an attenuation of a signal originating at a third node within the cluster with a known transmittance power of the third node.

19. (Original) The wireless communication network of claim 16, wherein the wireless communication network is an ad-hoc network of sensors.

20. (Original) The wireless communication network of claim 16, wherein the wireless communication network is an ad-hoc low-mobility network.

21. (Original) The wireless communication network of claim 16, wherein the detector element periodically updates the minimum transmittance power required to convey data to the nodes within the cluster of N nodes.

22. (Original) The wireless communication network of claim 16, wherein the detector element dynamically determines an operating power level based on multi-hop data throughput.

23. (Original) The wireless communication network of claim 16, wherein the minimum transmittance power is selected based on interference zones and multi-hop data throughput.

24. (Currently Amended) A power-controlled wireless communication device for use in a network, the network having n nodes, said power-controlled wireless communication device comprising:

    an antenna element for radiating and detecting signals, the antenna element configured to receive a signal from another wireless communication device;

a detector element configured to determine a received power level of the

received signal from the other wireless communication device, the other wireless

communication device transmitting at a known transmit power level, the other

wireless communication device belonging to a cluster of nodes, the cluster having

5   N nodes, where $2 \leq N < n\text{-}1$; and

a connectivity table for storing an <u>identifier</u> ~~ID~~ of the other wireless

communication device and an associated transmit power level associated with the

other wireless communication device, the associated transmit power level being

calculated from the known transmit power level and the received power level.

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25. (Original) The wireless communication device of claim 24, wherein the detector

element periodically updates the minimum transmittance power required to

convey data to the nodes within the cluster of nodes.

15   26. (Original) The wireless communication device of claim 24, wherein the detector

element dynamically determines an operating power level based on multi-hop

data throughput.

27. (Original) The wireless communication device of claim 24, wherein the

20   transmittance power is selected based on interference zones and end-to-end data

throughput.

28. (Currently Amended) A method for improving multi-hop network data

throughput in wireless ad hoc networks by optimizing transmitter output power,

25   the wireless ad hoc network having n nodes, the method comprising acts of:

receiving a plurality of signals from <u>a cluster of</u> different wireless nodes in

the wireless ad hoc network wherein at least one received signal has a known

transmittance power;

calculating a degree of signal attenuation for at least one node in the

30   cluster; ~~and~~

utilizing the determined degree of signal attenuation and the known

transmittance powers to calculate a near optimal transmittance power, whereby a

cluster of N neighbors is determined, wherein $2 \leq N < n-1$; and

    wherein the method is applied to a network of sensor nodes.

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29. (Original) The method of claim 28 further comprising an act of periodically

    updating the near optimal transmittance power.

30. (Original) The method of claim 28 further comprising an act of dynamically

10   updating the near optimal transmittance power.

31. (Original) The method of claim 28 wherein the near optimal transmittance power

    is calculated based on interference zones and multi-hop data throughput.

15   32. (Cancelled)

33. (Original) The method of claim 28 wherein the method is applied to a network of

    low-mobility nodes.

20   34. (Currently Amended) A method of optimizing power consumption in a network,

    the network having a first node and a second node, the method comprising steps

    of:

            receiving a beacon signal from the first node at a known transmit power;

            measuring a received power level of the beacon signal at the second node;

25   calculating a optimum transmit power from the second node to the first

    node based upon the known transmit power and the received power level of the

    beacon; and

            utilizing the optimum transmit power when sending data from the second

    node to the first node; and

30   wherein the method is applied to a network of sensor nodes.

35. (Original) The method of claim 34 further comprising an act of periodically

    updating the near optimal transmittance power.

36. (Original) The method of claim 34 further comprising an act of dynamically updating the near optimal transmittance power.

5   37. (Original) The method of claim 34 wherein the near optimal transmittance power is calculated so as to minimize interference zones and maximize multi-hop data throughput.

38. (Cancelled)

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39. (Original) The method of claim 34 wherein the method is applied to a network of low-mobility nodes.

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